

CLAIMS

1. A method of performing a function of the subscriber terminal location service in a packet-switched radio system, comprising
the subscriber terminal transmitting a request message for location
service to the core network of the radio system via the radio network of the
radio system;
performing at least one location service function required in the re-
quest message;
the core network transmitting a response message to the subscriber
terminal via the radio network.
- 10 2. A method according to claim 1, wherein the request message re-
lates to one of the following location service functions: determination of the
subscriber terminal location, informing of an outside client of the radio system
of the subscriber terminal location, transmission of location assistance data to
the subscriber terminal, transmission of a ciphering key for decrypting the loca-
tion assistance data to the subscriber terminal.
- 15 3. A method according to claim 1, wherein the information included
in the request message comprises identity of the serving cell, and/or timing
information on the radio connection, and/or other information on the radio sys-
tem or on the subscriber terminal, and/or desired quality of service of the re-
quested location service, and/or the telecommunications address of the out-
side client who wants location information on the subscriber terminal.
- 20 4. A method according to claim 3, wherein the other information
comprises at least one of the following parameters: receiving power of the
serving cell, receiving power of at least one neighboring cell, charge level of
the battery in the subscriber terminal, information on the conditions at the loca-
tion of the subscriber terminal, identity of a separate device connected to the
subscriber terminal.
- 25 5. A method according to claim 1, wherein at least part of the infor-
mation included in the request message received by the core network has
been inserted into the request message by the subscriber terminal.
- 30 6. A method according to claim 1, wherein at least part of the infor-
mation included in the request message received by the core network has
been inserted into the request message by the radio network.

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7. A method according to claim 1, wherein, if the function is location of the subscriber terminal, a special location procedure will be performed.
8. A method according to claim 7, wherein the core network locates the subscriber terminal on the basis of the information included in the request message.
9. A method according to claim 7, wherein the procedures required by the location service comprise receiving signals in the subscriber terminal and measuring them, or transmitting signals from the subscriber terminal.
10. A method according to claim 9, wherein the signals received in the subscriber terminal for implementing the location service comprise signals transmitted by the radio system, including signals transmitted by other base stations of the radio system than by that of the serving cell, or the signals transmitted by a satellite of the GPS system.
11. A method according to claim 1, wherein the network part of the radio system checks whether the location of the subscriber terminal carried out corresponds to the target set for the quality of service.
12. A method according to claim 11, wherein, if the target set for the quality of service is not achieved, the network part will perform a location service which offers a better quality of service.
13. A method according to claim 1, wherein tracing of the route traveled by the subscriber terminal is performed so that the subscriber terminal at regular intervals transmits a request message requesting location of the subscriber terminal.
14. A method according to claim 1, wherein tracing of the route traveled by the subscriber terminal is performed so that one parameter to be added to one location request is a definition of the need to determine the location of the subscriber terminal at regular intervals.
15. A method according to claim 1, wherein the outside client of the radio system is informed of the location of the subscriber terminal by the core network, by the subscriber terminal, or together by the core network and the subscriber terminal.
16. A method according to claim 1, wherein the response message contains at least one of the following pieces of information: the location of the subscriber terminal, location assistance data, a ciphering key for decrypting the location assistance data, the error code, information on whether the location information of the subscriber terminal is to be submitted to an outside client.

17. A method according to claim 1, wherein the request message and the response message are messages of protocol layers that correspond to the third layer of the OSI model.

18. A packet-switched radio system comprising:
5 a network part of the radio system, which comprises a core network and a radio network connected to the core network,
a radio connection from the radio network to a subscriber terminal;
and

the network part comprising location service means for locating the subscriber terminal; and

the subscriber terminal comprises means for transmitting a request message for location service to the core network via the radio network;

the network part comprises means for performing at least one function required in the request message and means for transmitting a response message to the subscriber terminal via the radio network.

19. A radio system according to claim 18, wherein the request message relates to one of the following location service functions: determination of the subscriber terminal location, informing of an outside client of the radio system of the subscriber terminal location, transmission of location assistance data to the subscriber terminal, transmission of a ciphering key for decrypting the location assistance data to the subscriber terminal.

20. A radio system according to claim 18, wherein the information included in the request message comprises identity of the serving cell, and/or timing information on the radio connection, and/or other information on the radio system or on the subscriber terminal, and/or desired quality of service of the requested location service, and/or the telecommunications address of the outside client who wants location information on the subscriber terminal.

21. A radio system according to claim 20, wherein the other information comprises at least one of the following parameters: receiving power of the 30 serving cell, receiving power of at least one neighboring cell, charge level of the battery in the subscriber terminal, information on the conditions at the location of the subscriber terminal, identity of a separate device connected to the subscriber terminal.

22. A radio system according to claim 18, wherein the subscriber 35 terminal comprises means for inserting at least part of the information included

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in the request message received by the core network into the request message.

23. A radio system according to claim 18, wherein the radio network comprises means for inserting at least part of the information included in the request message received by the core network into the request message.

5 24. A radio system according to claim 18, wherein, if the function is location of the subscriber terminal, a special location procedure will be performed.

10 25. A radio system according to claim 24, wherein the core network comprises means for locating the subscriber terminal on the basis of the information included in the request message.

26. A radio system according to claim 24, wherein the procedures required by the location service comprise receiving signals in the subscriber terminal and measuring them, or transmitting signals from the subscriber terminal.

-15 27. A radio system according to claim 26, wherein the signals received in the subscriber terminal to implement the location service comprise signals transmitted by the radio system, including signals transmitted by other base stations of the radio system than by that of the serving cell, or the signals transmitted by a satellite of the GPS system.

20 28. A radio system according to claim 18, wherein the network part of the radio system comprises means for checking whether the location of the subscriber terminal carried out corresponds to the target set for the quality of service.

25 29. A radio system according to claim 28, wherein, if the target set for the quality of service is not achieved, the network part will perform a location service which offers a better quality of service.

30 30. A radio system according to claim 18, wherein tracing of the route traveled by the subscriber terminal is performed so that the subscriber terminal at regular intervals transmits a request message requesting location of the subscriber terminal.

35 31. A radio system according to claim 18, wherein tracing of the route traveled by the subscriber terminal is performed so that one parameter to be added to one location request is a definition of the need to determine the location of the subscriber terminal at regular intervals.

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32. A radio system according to claim 18, wherein the outside client of the radio system is informed of the location of the subscriber terminal by the core network, by the subscriber terminal, or together by the core network and the subscriber terminal.

5 33. A radio system according to claim 18, wherein the response message contains at least one of the following pieces of information: the location of the subscriber terminal, location assistance data, a ciphering key for decrypting the location assistance data, an error code, information on whether location information on the subscriber terminal is to be submitted to an outside client.

10 34. A radio system according to claim 18, wherein the request message and the response message are messages of protocol layers that correspond to the third layer of the OSI model.

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